NEW MITES FROM THE YAMPA VALLEY[1] (ACARINA: CRYPTOSTIGMATA: ORIBATULIDAE, PASSALOZETIDAE)

Harold G. Higgins[2] and Tyler A. Woolley[3]

Abstract.— A study was made of the soil mites from under different vegetative types near a coal-burning power plant in the Yampa Valley near Hayden, Colorado. The following new species of oribatids were found: *Zygoribatula apletosa* n.sp., *Multoribates haydeni* n.sp., *Paraphauloppia cordylinosa* n.sp., *Passalozetes moniles* n.sp.

Concentrated collections have been made near a coal-burning power plant in the Yampa Valley near Hayden, Colorado. A number of new and unrecorded species of soil mites for Colorado have been found in the project area. The collections were made with reference to the soil forms and to vegetative types with which they were found. As might be expected, many species appear to be more abundant at one season of the year than at another or may be more closely associated with certain vegetative types than with others.

This concentrated collecting over a two-year period has given new insight as to the importance of the microclimate in the biology of oribatids. For example, depending on the amount of moisture, sunlight or shade, and slope, many species may be more abundant under one side of a bush than under the other. Preliminary studies also indicate that destruction of vegetation and disturbances of the soil in such changes as the formation of spoil banks or strip-mining and pollution from coal-burning power plants seriously depletes the numbers and kinds of soil arthropods.

Following are descriptions of four new species representing two families of oribatids found in the Hayden area.

Family Oribatulidae

Zygoribatula apletosa, n.sp.

Figs. 1 and 2

Diagnosis.— Large size, larger than any known *Zygoribatula*; with 14 pairs of large, setose notogastral setae; rostral hairs further apart than lamellar hairs; lamellae curved inward with distinct translamella; areae porosae *Aa* located near the small shoulder projections. The trivial name *apletosa* is modified from the Greek, and implies "immense," referring to the size of these oribatids.

Description.— Color reddish-brown; rostrum rounded; rostral hairs heavy, reaching beyond tip of rostrum by about half their lengths, hairs farther apart than lamellar setae; lamellae of almost uniform width throughout, length curved inward toward anterior tip, slightly less than one-half as far apart at tip as at base; translamella narrower than lamellae; lamellar hairs similar to rostral hairs but about one-third longer inserted in anterolateral ends of lamellae; interlamellar hairs situated midway between insertions of lamellar hairs and pseudostigmata, closer to inner margin of lamellae; pseudostigmata cuplike with edge erected above surface of prodorsum; sensillum with broad, rounded setose head and short pedicel, about half as long as interlamellar hair; exobothridial hair rather heavy and stiff.

Hysterosoma longer than broad, widest near middle, with tapering posterior end; dorsal surface with 14 pairs of heavy, long, spined setae, many extending beyond body outline as shown in Figure 1; areae porosae all large, *Aa* much longer than broad and located near small humeral process.

Camerostome oval in outline; ventral surface with apodemata and setae as shown in Figure 2; genital and anal apertures far apart, smaller genital opening more than twice its length anterior to larger anal aperture; each genital cover with four setae; aggenital setae as shown in Figure 2; each anal cover with two setae (2 of 12 specimens with 3 anal setae); two adanal setae present.

Legs all about equal in size; heterotridactylous, median claw larger than laterals.

[1]Yampa Valley Project, Ecology Consultants, Inc.
[2]Biology Department, Granger High School, Granger, Utah.
[3]Department of Zoology and Entomology, Colorado State University, Fort Collins, Colo. 80523.

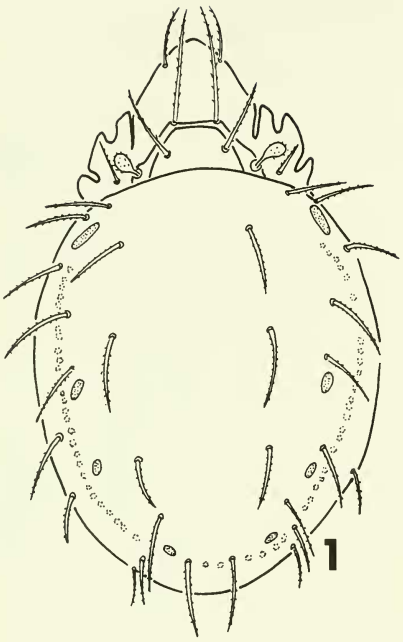

Fig. 1. *Zygoribatula apletosa*, dorsal aspect, legs omitted.

Measurements.— length .705 mm; width, .495 mm. (Range .853-.705 mm X .600-.495 mm). The type (a male) and 6 paratypes (6 females) were taken under serviceberry about ¼ mile NE power plant, Hayden, Colorado, 7 Oct. 1971, by H. G. Higgins; 2 specimens, females, were taken under rosebush, ½ mile N power plant, Hayden, Colorado, 21 June 1972; 2 specimens (males) were taken ½ mile N power plant, Hayden, Colorado, 1 Aug. 1971; 1 specimen (male) was taken under aspens, 4 miles S Seneca Road, Hayden, Colorado, 1 Aug. 1971; all by H. G. Higgins.

Discussion.— This species stands apart from other known North American *Zygoribatula* by its large size, its long, heavy, setose body setae, and by its big, long, areae porosae *Aa* located near the shoulder. In general appearance *Z. apletosa* n.sp. resembles *Z. lata* Hammer but differs in the much larger size as well as in the size and locations of areae porosae.

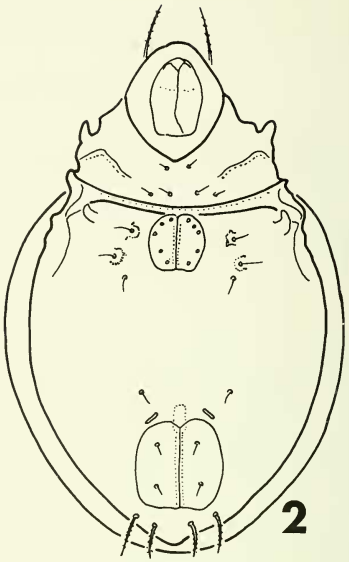

Fig. 2. *Z. apletosa*, ventral aspect.

To date, this species has always been found associated with rather heavy, moist litter under dense vegetation.

This species shows interesting variation in the width of the translamellae and location of body setae. Also, as pointed out earlier, 2 of 12 specimens have 3 pairs, rather than 2 pairs, of anal setae.

Multoribates haydeni, n.sp.
Fig. 3

Diagnosis.— Similar to *Multoribates chavinensis* Hammer, 1961, but larger, and with only 11 pairs of dorsal setae; lacks the ventral keel on femur II. The trivial name is indicative of location.

Description.— Large size; color yellowish to light brown; body egg-shaped with the pteromorphs hardly projecting beyond lateral outline of body; prodorsum triangular in outline with rostrum fairly pointed, often hyaline; rostral setae inserted posteriorly on lateral margins of propodosoma, much wider apart than lamellar hairs; lamellae narrow, tapering slightly anteriorly; translamellae absent; lamellar hairs stiff, setose about same length as lamellae; interlamellar hairs

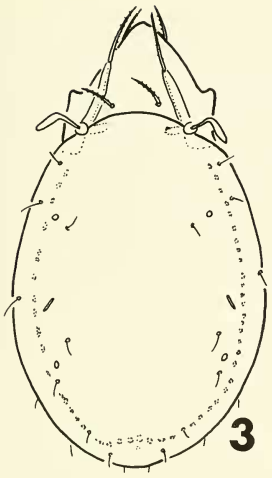

Fig. 3. *Multoribates haydeni*, dorsal aspect, legs omitted.

heavy, nearly equal in length to lamellar hairs; pseudostigmata cuplike, rim projecting beyond the body level; sensillum with narrow stalk and broad, setose head that is bent backwards; dorsosejugal suture curved anteriorly.

Hysterosoma longer than broad with small pteromorphs that project only slightly beyond the outline of body; 11 pairs of fine, simple dorsal hairs visible as shown in Figure 3; areae porosae absent, but replaced with chitinous pores; muscle scars and markings visible round edge of hysterosoma as indicated in Figure 3. Variations occur in the locations of body setae.

Ventral surface similar to *M. chavinensis* with only a few minor exceptions; genital plates separated from larger anal plates by approximately twice their length, each plate with four setae; anal plates much larger than genital plates, situated near posterior end of body, each anal plate with two hairs; adanal and aggenital setae place similarly to *M. chavinensis;* fissure *iad* located near anteromediad margin of anal plates.

Legs about equal in size; all legs heterotridactylous, median claw larger than laterals; femur II without visible keel.

Measurements.— Length, .45 mm; width, .26 mm. The type, a gravid female was collected at Seneca #2, Hayden, Colorado, under serviceberry, 10 April 1971, by H. G. Higgins and T. A. Woolley. Additional specimens are as follows: 1 specimen at Seneca #2, Hayden, Colorado, 9 June 1971, in sagebrush, by T. A. Woolley and H. G. Higgins; 3 specimens from under aspens associated with bitterbrush (*Purshia*), 8 June 1971, 4 miles S Seneca Road, Hayden, Colorado, by H. G. Higgins and T. A. Woolley; 6 specimens from under bitterbrush, 5 miles S Seneca Road, Hayden, Colorado, 1 Aug. 1971, by H. G. Higgins; 8 specimens from under bitterbrush, 5 miles S Seneca Road, Hayden, Colorado, 8 Oct. 1971, by H. G. Higgins; 1 specimen from under bitterbrush, 4 miles S Seneca Road, Hayden, Colorado, 21 June 1972, by H. G. Higgins.

Discussion.— In general appearance *M. haydeni*, n.sp. resembles *M. chavinensis* Hammer but is larger, lacks the ventral keel on femur II, and has 11 rather than 14 pairs of dorsal setae. Preliminary study seems to indicate that although this new species is found in several habitats, it prefers the microhabitat under bitterbrush in rather arid conditions.

Paraphauloppia cordylinosa, n.sp.

Fig. 4

Diagnosis.—Similar in outline to *Paraphauloppia novazealandica* Hammer, 1967, but with much larger lamellae and 11 pairs of notogastral hairs. The name *cordylinosa* refers to the clublike sensillum of the new species.

Description.— Color yellowish; rostral setae large, rough, situated on the anterolateral margins of the propodosoma; lamellae quite large, extended more than half the length of propodosoma, about equal in width throughout theirs lengths, with a small spur (prolamella) located anteromediad; lamellar hairs inserted in anterior tip of lamellae, extending to tip of rostrum, heavy, barbed, and about equal in length to rostral hairs; interlamellar hairs three-fourths as long as lamellar hairs, inserted mediad, closer to pseudostigmata than to tip of lamellae extending to the sides of prodorsum; pseudostigmata cuplike with a short stalk and expanded, rounded, setose head.

Hysterosoma oval, tapering anteriorly; dorsosejugal suture greatly arched; ptero-

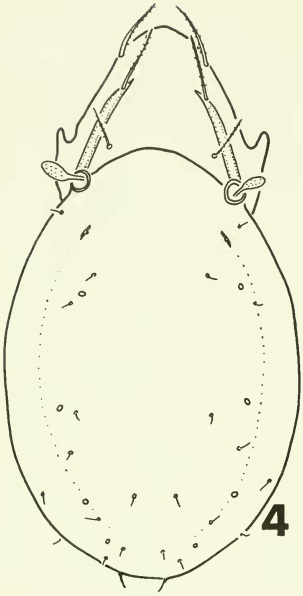

Fig. 4. *Paraphauloppia cordylinosa*, dorsal aspect, legs omitted.

morphs absent; 11 pairs of simple smooth, dorsal hairs as shown in Figure 4. Areae porosae visible but not noticeably enlarged as in *P. novazealandica;* a line of light marking, probably muscle scars, visible mediad of lateral margins.

Anal opening much larger than genital opening and situated near posterior end of body, each cover with two setae; genital opening smaller, situated about twice its length in front of anal opening, three pairs of visible hairs on each plate; aggenital setae posterior to genital plate; aggenital and adanalsetae located similarly to *P. novazealandica*. ad_1 posterior to anal plate, ad_2 situated near the middle of plate along lateral side, and ad_3 situated anterior to anal plate.

All legs about equal in size, heterotridactylous, with median claw larger than laterals.

Measurements.— Length, 282μ; width, 132μ. The type (a female) and a paratype from sagebrush, Yampa Airport, Hayden, Colorado, 9 June 1971; 6 specimens from sagebrush, 2 miles S Yampa Airport, Hayden, Colorado, 9 June 1971; all by H. G. Higgins and T. A. Woolley.

Discussion.— In general appearance this species resembles *P. novazealandica* Hammer but differs in having much larger, heavier lamellae and 11 rather than 10 pairs of dorsal setae. Although this taxon differs somewhat from *Paraphauloppia* in the number of dorsal setae, it appears to be nearer this genus than to *Phauloppia*. We hesitate, at this time, to describe a new genus based on these minor differences and because in the small sample of mites collected there is great variation in the exact location of the dorsal setae, and the lengths of the lamellar hair. It is interesting that although collections were made at the same general site several times a year, and over a two-year span, specimens of this species were found only once, in June 1971, and those in rather dry sagebrush habitat. Preliminary postulations attribute this to the possible influence of pollutants in the area.

Family Passalozetidae

Passalozetes moniles, n.sp.

Figs. 5-6

Diagnosis.— This species is readily separated from *P. linearis*, the only other known North American species, by the banded, beadlike pattern of dorsal and ventral integuminal and by the smooth sensillum with a pointed tapered head. The trivial name *moniles* is modified from the Latin meaning "necklace" and refers to the beaded appearance of the integument.

Description.—Yellowish in color; prodorsum slightly wider than long; rostrum blunt, rounded; rostral hairs simple, inserted near tip of rostrum, curved medially toward tip of rostrum; lamellae absent; lamellar hairs small, simple, slightly longer than rostral hairs, curved down toward tip of rostrum; interlamellar hairs threadlike, simple, inserted anteromediad of pseudostigmata, adjacent to coalesced median section of dorsosejugal suture; pseudostigmata cuplike, separated from each other by a little more than length of sensillum; sensillum with a narrow curved base and tapering into a narrow pointed head.

Hysterosoma oval, anterior margin extended forward, coalesced medially with

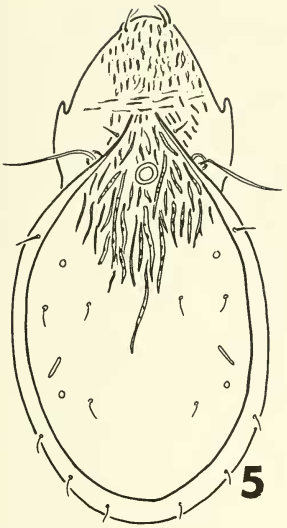

Fig. 5. *Passalozetes moniles*, dorsal aspect, legs omitted.

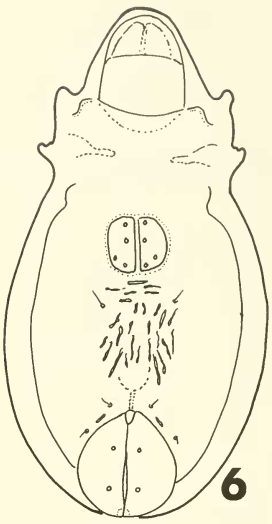

Fig. 6. *P. moniles*, ventral aspect, legs omitted.

dorsum of propodosoma beyond level of interlamellar hairs; dorsosejugal suture interrupted by this middle projection; lenticulus clear, round, surrounded by lines; dorsum with simple hairs as shown in Figure 5. Integument of fine lines with darker pigmented areas resembling strings of beads (the beadlike cerotegument may be removed by soaking in lactophenol); two pairs of area porosae and a glandular fissure as seen in Figure 5.

Camerostome with rather parallel sides, longer than wide; ventral plate as seen in Figure 6; genital covers each with four pairs of genital setae; aggenital setae inserted about twice their lengths posterolaterad of genital aperture; anal aperture nearly one-third larger than anal opening; anal aperture in the posterior end of ventral plate, each cover with two setae; adanal setae difficult to find in the cerotegument, visible setae and glands as shown in Figure 6.

All tarsi heterobidactylous, heavier of the two claws toothed (median or lateral).

Measurements.— Length, .36 mm; width, .15 mm.

The type (a male) and 3 paratypes were taken from under bitterbrush and squawbrush, 6 miles E Craig, Colorado, 14 June 1972; 4 specimens from burned-over area at Seneca #3, Hayden, Colorado, 21 June 1972; all by H. G. Higgins.

Discussion.— As is to be expected, there is considerable variation in the arrangement of setae and pigmentation in specimens examined. Those examples from the burned-over area were more heavily pigmented and have a wider hysterosoma than those taken near Craig. The only previously described *Passalozetes* from this western area was taken from a dry woodrat nest in Tooele Co., Utah, several hundred miles to the west of the location of this new species. Both North American species of Passalozetes have been taken from dry desert sands, which implies that they are found in xeric habitats.

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